WHAT IS CLAIMED IS:

1. An optical device comprising:

a substrate; and

a plurality of first optical regions; and

a plurality of second optical regions that has a characteristic that is different from the plurality of first optical regions;

wherein the first and second optical regions are interleaved with each other on the substrate;

wherein each of the first and second optical regions have a substantially polygon shape with a plurality of substantially regular edges; and

wherein at least one first optical region of the plurality of first optical regions includes at least one predetermined irregularity on at least one edge.

2. The optical device of claim 1 wherein the one irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge by an amount that is related to a size of the one irregularity.

3. The optical device of claim 1 wherein the device is a mask and the first optical regions and the second optical regions form an array.

4. The optical device of claim 3 wherein the mask is a phase mask and the characteristic is thickness in the direction of an optical axis of the device.

5. The optical device of claim 3 wherein the mask is an absorption mask, and the characteristic is transmittance.

6. The optical device of claim 1 wherein each of the first and second optical regions are formed from a plurality of pixels arranged in the polygon shape.

7. The optical device of claim 6 wherein the irregularity is an extra pixel.

8. The optical device of claim 7 wherein the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and away from the region by an amount that is the size of the shifted pixel divided by the number of pixels on the one edge.

9. The optical device of claim 6 wherein the irregularity is a missing pixel.

10. The optical device of claim 9 wherein the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge.

11. The optical device of claim 6 wherein the irregularity is a shifted pixel located on one edge which has been shifted from an opposite edge of the polygon shape from the one edge.

12. The optical device of claim 11 wherein:

the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and away from the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge; and

the irregularity is operative to effectively shift the other edge in a direction that is orthogonal to the edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other edge.

13. An optical mask comprising:

a plurality of bars arranged in a period array along a first axis of the mask, with spaces between adjacent bars;

wherein each of the bars have substantially regular edges; and

wherein at least one bar includes at least one predetermined irregularity on at least one edge.

14. The optical mask of claim 13 wherein the one irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge by an amount that is related to a size of the one irregularity.

15. The optical mask of claim 13 wherein the mask is a phase mask, and the bars have a different thickness in the direction of an optical axis of the mask than the spaces.

16. The optical mask of claim 13 wherein the mask is an absorption mask, and the bars have a different transmittance than the spaces.

17. The optical mask of claim 13 wherein the bars are formed from a plurality of pixels.

18. The optical mask of claim 17 wherein the irregularity is an extra pixel.

19. The optical mask of claim 18 wherein the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and away from the bar by an amount that is the size of the shifted pixel divided by the number of pixels on the one edge.

20. The optical mask of claim 17 wherein the irregularity is a missing pixel.

21. The optical mask of claim 13 wherein the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and into the bar by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge.

22. The optical device of claim 17 wherein the irregularity is a shifted pixel located on one edge which has been shifted from an opposite edge of the bar from the one edge.

23. The optical device of claim 22 wherein:

the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and away from bar by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge; and

the irregularity is operative to effectively shift the other edge in a direction that is orthogonal to the edge and into the bar by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other edge.

24. An optical system for writing a grating into an optical fiber, wherein the optical fiber is located at an output plane of the optical device, the optical system comprising:

a beam generator that provides an input beam; and

a beam separator that receives an input beam and separates the input beam into a plurality of beams;

wherein the plurality of beams interfere with each other at the output plane to form an interference pattern that is used to form the grating; and

wherein the beam separator includes:

a substrate; and

a plurality of first optical regions; and

a plurality of second optical regions that has a characteristic that is different from the plurality of first optical regions;

wherein the first and second optical regions are interleaved with each other on the substrate;

wherein each of the first and second optical regions have a substantially polygon shape with a plurality of substantially regular edges; and

wherein at least one first optical region of the plurality of first optical regions includes at least one predetermined irregularity on at least one edge.

25. The optical system of claim 24 wherein the one irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge by an amount that is related to a size of the one irregularity.

26. The optical system of claim 24 wherein the beam separator is a mask and the first optical regions and the second optical regions form an array.

27. The optical system of claim 26 wherein the mask is a phase mask and the characteristic is thickness in the direction of an optical axis of the beam separator.

28. The optical system of claim 26 wherein the mask is an absorption mask, and the characteristic is transmittance.

29. The optical system of claim 24 wherein each of the first and second optical regions are formed from a plurality of pixels arranged in the polygon shape.

30. The optical system of claim 29 wherein the irregularity is an extra pixel.

31. The optical system of claim 30 wherein the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and away from the region by an amount that is the size of the shifted pixel divided by the number of pixels on the one edge.

32. The optical system of claim 29 wherein the irregularity is a missing pixel.

33. The optical system of claim 32 wherein the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge.

34. The optical system of claim 29 wherein the irregularity is a shifted pixel located on one edge which has been shifted from an opposite edge of the polygon shape from the one edge.

35. The optical system of claim 34 wherein:

the irregularity is operative to effectively shift the one edge in a direction that is orthogonal to the edge and away from the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge; and

the irregularity is operative to effectively shift the other edge in a direction that is orthogonal to the edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other edge.

36. The optical system of claim 24 wherein the grating is a Bragg grating.

37. The optical system of claim 24 wherein the input beam is an ultraviolet input beam.

38. The optical system of claim 24 wherein the beams separator forms the plurality of beams by diffracting the input beam into two first order beams.

39. The optical system of claim 38 wherein the device further comprises:

a stop which blocks a zero order diffracted beam.

40. The optical system of claim 24 further comprising:

a focusing lens system that focuses the input beam through the beam separator, thereby focusing the plurality of beams onto the output plane.

41. The optical system of claim 40 wherein:

the beam separator is larger than a core of the optical fiber in a direction that is orthogonal to the optical axis of the fiber.

42. The optical system of claim 40 wherein the focusing lens system only focuses light in a direction that is orthogonal from the optical axis of the optical fiber.

43. The optical system of claim 42 wherein the focusing lens system comprises a cylindrical lens.

44. The optical system of claim 40 further comprising:

an optical imaging system between the separator and the output plane that images the plurality of beams onto the output plane.

45. The optical system of claim 44 wherein:

the beam separator is larger than a core of the optical fiber in a direction that is orthogonal to the optical axis of the fiber.

46. The optical system of claim 44 wherein the imaging system only images light in a direction that is parallel to the optical axis of the optical fiber.

47. The optical system of claim 44 wherein the optical imaging system comprises at least one cylindrical lens.

48. The optical device of claim 24 wherein the grating is a chirped grating.

49. The optical device of claim 48 wherein the grating is a linear chirped grating.

50. The optical device of claim 48 wherein the grating is a non-linear chirped grating.

51. The optical device of claim 24 wherein the grating includes a plurality of discrete phase shifts.

52. The optical device of claim 24 wherein the grating includes a substantially continuous and spatially varying phase shift.

53. A method for writing a grating into an optical fiber, the method comprising:

providing an input beam; and

separating the input beam into a plurality of beams;

interfering the plurality of beams with each other to form an interference pattern that is used to form the grating; and

wherein the step of separating includes:

providing a plurality of first optical regions; and

providing a plurality of second optical regions that has a characteristic that is different from the plurality of first optical regions; wherein the first and second optical regions are interleaved with each other on the substrate; and wherein each of the first and second optical regions have a substantially polygon shape with a plurality of substantially regular edges; and

providing at least one predetermined irregularity on at least one edge of at least one first optical region of the plurality of first optical regions which effectively shifts the one edge in a direction that is orthogonal to the edge by an amount that is related to a size of the one irregularity.

54. The method of claim 53 wherein the step of providing the plurality of first optical regions comprises:

arranging a plurality of pixels to form each polygon shape.

55. The method of claim 54 wherein the step of providing at least one predetermined irregularity comprises:

adding an extra pixel to the one edge;

wherein the step of adding operates to effectively shift the one edge in a direction that is orthogonal to the edge and away from the region by an amount that is the size of the shifted pixel divided by the number of pixels on the one edge.

56. The method of claim 54 wherein the step of providing at least one predetermined irregularity comprises:

removing a pixel from the one edge;

wherein the step of removing operates to effectively shift the one edge in a direction that is orthogonal to the edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge.

57. The method of claim 54 wherein the step of providing at least one predetermined irregularity comprises:

shifting a pixel to the one edge from an opposite edge of the polygon shape from the one edge

wherein the step of shifting operates to effectively shift the one edge in a direction that is orthogonal to the edge and away from the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one edge, and to effectively shift the other edge in a direction that is orthogonal to the edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other edge.

58. The method of claim 57 wherein the grating is a Bragg grating.

59. The method of claim 53 wherein the input beam is an ultraviolet input beam.

60. The method of claim 53 wherein the step of separating comprises: diffracting the input beam into a plurality of first order beams.

61. The method of claim 60 wherein the step of separating further comprises: blocking a zero order diffracted beam.

62. The method of claim 53 further comprising:

focusing the plurality of beams into the optical fiber.

63. The method of claim 62 further comprising:

focusing the plurality of beams in a direction orthogonal from the optical axis of the optical fiber.

64. The method of claim 63 further comprising:

imaging the plurality of beams in a direction parallel to an optical axis of the optical fiber.

65. The method of claim 53 wherein the grating is a chirped grating.

66. The method of claim 53 wherein the grating is a linear chirped grating.

67. The method of claim 53 wherein the grating is a non-linear chirped grating.

68. The method of claim 53 wherein the grating includes a plurality of discrete phase shifts.

69. The method of claim 53 wherein the grating includes a substantially continuous and spatially varying phase shift.